

## A flightless brown Lacewing from Colombia

(Neuroptera, Hemerobiidae)

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### Abstract

A new species of flightless hemerobiid, *Nusalala andinus*, is described from the Andes Mountains near Bogotá, Colombia.

### Introduction

TWEEDIE (1972) and PENNY (1977) have discussed adaptations found among adult insects living in alpine, boreal or winter climates. Two of the most distinctive of these characteristics are reduced wing surface area and an increase in pilosity. Insular faunas often show many of the same characteristics as insects living in colder, boreal climates, and within the Hemerobiidae three heavily-sclerotized, and probably flightless, genera are known: *Conchopterella* Handschin, a probable derivative of *Gayomyia* existing on Juan Fernandez Islands off the coast of Chile, and *Pseudopsectra* Perkins and *Nesothauma* Perkins, probable derivatives of *Nesomicromus* living on the Hawaiian Islands (ZIMMERMAN, 1957). However, recently a further species was discovered living at an altitude of 3700 m near Bogotá, Colombia, for the first record of a flightless brown lacewing from continental South America. Forewings are quite small in relation to body size, with pilosity along longitudinal veins markedly abundant. Hindwings have been reduced to tiny, membranous stubs, resembling the halteres of Diptera.

The genus *Nusalala* was originally described by NAVAS in 1913 for those species of Hemerobiidae which appeared similar to *Micromus*, but which had three gradate series of crossveins, and MP reduced to a short crossvein uniting with CuA. In specimens with heavily sclerotized wings, the venation is difficult to interpret and subject to considerable variation. However, there is one additional difference between the genera – *Nusalala* has an elongate central shaft basally on the male parameres, which is lacking in *Micromus*. *Micromus* is known from many parts of the world, such as Europe, North America, and South Africa, but so far has not been recorded from the Neotropical Region, and species, such as *Micromus dispar* Banks, 1910, actually belong to the genus *Nusalala*. Thus, this new species from the Colombian Andes belongs to the genus *Nusalala*.

*Nusalala andinus* Penny & Sturm, new species  
(Figs. 1-6)

Original description based on 2 males, in alcohol.

Head: Reddish brown; frons, labrum and genae without pilosity; occiput densely covered with stout, black setae. Maxillary palpi five-segmented, yellowish. Labial palpi three-segmented, yellowish.



Fig. 1: Lateral view of *Nusalala andinus*, n. sp. (drawn by Artêmio Coelho da Silva).

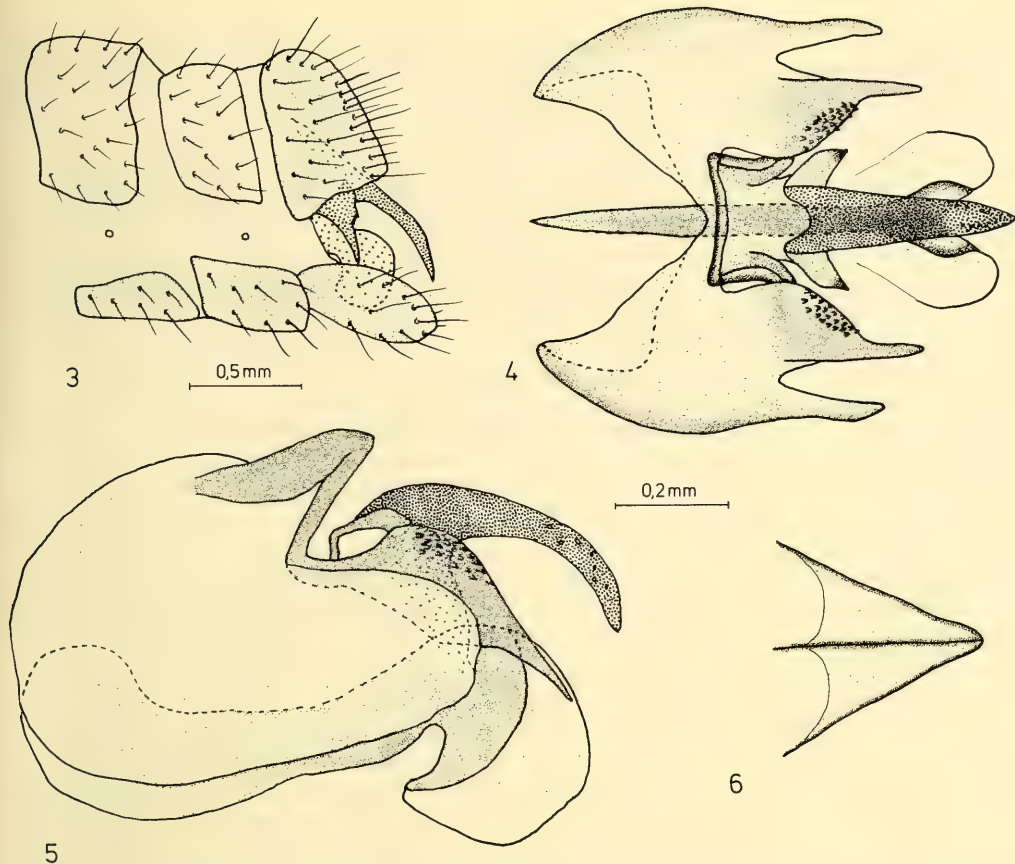


Fig. 2: Right forewing of paratype of *Nusalala andinus*, n. sp. (photo courtesy of Philip A. Adams).

Antennae consisting of quadrate scape; elongate cylindrical pedicel; and 40–41 moniliform, yellowish-brown flagellomeres, which become somewhat darker apically. Compound eyes dark, rather small, approximately same diameter as length of gena between compound eyes and labrum.

Thorax: Pronotum brown, becoming darker medially, with much fine, pale pilosity. Pleural areas yellowish-brown, devoid of pilosity.

Legs: All segments yellowish, with transverse dark brown bands near base and apex of fore and mid tibiae and apex of hind tibia. Each leg with two simple apical claws and arolium.



Figs. 3-6: *Nusalala andinus*, n. sp. 3. Apex of abdomen, lateral view, 4. male genitalia, dorsal view, 5. male genitalia, lateral view, 6. hypandrium internum, dorsal view.

Wings: Forewings heavily-sclerotized, short, reaching only to base of eighth abdominal segment (Fig. 1). Stout, abundant dark and pale setae along all veins. Membrane brown with veins much paler, with alternating dark and pale pattern along wing margin (Fig. 2). Lacking recurrent humeral vein, and most crossveins. Outer gradate series present, of about 8 crossveins. Hindwing reduced to small, membranous vestige lacking setae and with only 3 or 4 tiny basal remnants of veins.

Abdomen: All segments yellowish-brown with numerous, fine, pale setae. Callus cerci apparently absent. Male genitalia (Figs. 3-6) consisting of mediuncus elongate, downwardly curved, lanceolate, basally with lateral projections; entoprocessus basally bulbous with field of very small, dentate projections and apically pointed; gonarcus very thin, pale and plate-like; parameres forming fused, elongate, central shaft, with central, apical, heavily-sclerotized funnel, and divergent, lightly-sclerotized lateral plates; hypandrium internum triangular.

Body Length: male, 4.0 mm.

Antennal Length: male, 3.1 mm.

Forewing Length: male, 3.0 mm.

Female unknown.

Geographical Distribution: Colombia, 90 km south of Bogotá, Páramo de Sumapaz, near Cuchilla La Rabona, 3-X-1978, in tufts of *Calamagrostis effusa*, ca. 3800 m. Holotype male deposited in Museo de Historia Natural, Universidad Nacional, Bogotá; paratype male in U. S. National Museum.



Habitat and Ecology: The two specimens were collected in the paramo region that is in a relatively low vegetation type which occurs in the humid parts of the tropical Andes above timberline. Near the sample locality, besides the grass *Calamagrostis effusa* (H. B. K.) Steud., the following plant species were frequent: *Espeletia grandiflora* H. et B. (Compositae, "rosette tree"), *Swallenochloa tessellata* (Munroe) McClure, *Paepalanthus karstenii* Ruhl, *Hypericum laricifolium* Juss., *Pernettya prostrata* Sleumer and various species of mosses and lichens. Inclination of the locality ca. 15°W; soil wet to marshy, the upper decimeters of black color. In the center of a *Calamagrostis* tuft a temperature of 4.9°C was measured (10:30 a. m., light rainfall). This corresponds closely to the mean ambient temperature of the locality. To collect the animals some tufts were cut off, put on a cloth, and examined macroscopically. Other animals caught in the sample: 1 Blattaria, 1 Carabidae, 1 Lampyridae, 6 Curculionidae, 2 Diptera (Brachycera), 7 Araneae, 1 Lumbricidae; most of the specimens had a body length between 4 and 8 mm. More than 10 other samples of tufts from this and from other paramos brought no more Neuroptera. Observations about the behavior of the species were not made.

The male genitalia appear very elongate, with parameres medially fused for most of the length to form a single elongate shaft, and without even a vestige of caudal projections on the male ectoproc. The probability of convergent evolution due to harsh, wind-swept environments creates problems in determining the exact phylogenetic relationships of this new species, if based solely on the striking wing modifications. This species is very similar to *Pseudopsectra lobipennis* Perkins from the Hawaiian Islands in forewing shape and venation, and *Nusalala dispar* (Banks) in shape of the male genitalia. However, *N. andinus* does seem to be closely related to both genera, and for this reason we have hesitated in placing this new species in *Nusalala*. ZIMMERMAN (1957) states that *Pseudopsectra* and *Nesothauma* are autochthonous derivatives of *Nesomicromus* (which ASPÖCK, et al., 1980, considers to be a subgenus of *Micromus*). However, both ZIMMERMAN (1957) and NAKAHARA (1960) indicate that *Nesomicromus* has no entoprocessus, a structure very conspicuous in *Nusalala dispar* and *N. andinus*. ZIMMERMAN states that he feels *Pseudopsectra* is a polyphyletic genus, with its component species having been derived from several different *Nesomicromus* ancestors. As it seems that flightlessness and reduced, sclerotized wings have frequently evolved among island and montane species of insects, and as the genitalia of this new species appear more closely related to northern South American species of *Nusalala* than to Hawaiian species of *Pseudopsectra*, this new species has been placed in *Nusalala*.

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